

REMARKS/ARGUMENTS

The specification is amended to identify the instant application as a divisional of the parent application, rather than as a continuation, pursuant to the Examiner's request. Claims 11-14 are amended to use language in accordance with conventional U.S. practice. In addition, the claims are amended to provide express antecedent basis for certain terms referred to in the claims and also to expressly recite connections between certain structural elements. It is respectfully submitted that these amendments do not narrow the scope of the claims but merely provide express support for implicit subject matter.

Rejection Under 35 U.S.C. § 112, Second Paragraph

As noted above, the claims are amended to provide express antecedent basis for various features mentioned within the claims. While it is respectfully submitted that express antecedent basis is not always needed (see, e.g., MPEP 2173.05(e)), the claims are amended for purposes of furthering prosecution. The claims are also amended to provide express recitations of implicit structural connections.

In view of the above remarks, withdrawal of the rejection under 35 U.S.C. 112, second paragraph, is respectfully requested.

Rejection Under 35 U.S.C. § 103 In view of Frame et al. and Cooper et al.

Claims 1-14 are rejected under 35 U.S.C. § 103 in view of Frame et al. (U.S. '525) in combination with Cooper et al. ('989). This rejection is respectfully traversed.

Frame et al. disclose a process for treating a sour hydrocarbon fraction. In the process, mercaptans within the hydrocarbon fraction are reacted with hydrogen in the presence of a selective hydrogenation catalyst. In addition, the process further comprises oxidizing mercaptans by reacting them with an oxidizing agent in the presence of an oxidization catalyst and a basic component. The selective hydrogenation step and the oxidation step may be carried out in any order. See, e.g., column 10, lines 47-55.

In Example 1 at column 11, a feed comprising kerosene containing hydrogen is fed to a reactor containing a catalyst. The catalyst contains a support which is a mixture of alumina and

attapulgit. The catalyst further contains 10 weight % nickel dispersed on the support. The final product obtained from the hydrogenation step is divided into equal portions. One portion is processed through the hydrogenation reactor a second time. Thereafter, fresh feed, the once hydrogenolysed feed, and the twice hydrogenolysed feed are each subjected to an oxidation step wherein the feeds are contacted with an oxidation catalyst contained in a reactor. The oxidation catalyst is cobalt phthalocyanine on a carbon support.

Example 2 at columns 12-13 describes a similar process arrangement except that prior to subjecting the hydrogenolysed products to oxidation, the hydrogenolysed products are passed through a molecular sieve bed to remove hydrogen sulfide produced by the hydrogenation. See also Examples 3-5.

[In the rejection, it is alleged that Frame et al. disclose supplying effluent from at least one selective hydrogenation reactor into a "stabilization drum." In support of this assertion, the rejection cites column 11, line 43 - column 12, line 17.

However, no mention or suggestion of a stabilization drum is provided by the disclosure of Frame et al. In the portion of the disclosure cited in the rejection, Frame et al. merely disclose dividing the product from the hydrogenation reactor into two equal portions, one of which is sent back through the hydrogenation reactor, before the effluents are introduced into an oxidation reactor. There is no discussion or suggestion of introduction of effluent from the hydrogenation reactor into a stabilization drum, a drum that is provided with at least one gas outlet and an at least one stabilized effluent outlet [so that a separation of the gaseous fraction can be achieved.] *not in claims* Similarly, Frame et al. do not disclose a line for recycling stabilized effluent from such a drum to the hydrogenation reactor. In fact, Frame et al. do not even disclose that the return of one portion of the hydrogenation effluent back to the hydrogenation reactor involves a recycle line.]

Cooper et al. disclose a process in which an aerated liquid hydrocarbon feed stream containing mercaptans is contacted with a liquid aqueous caustic solution in a reaction vessel whereby mercaptans are converted to disulfides. Referring to the figure, the aerated liquid feedstream 20 is introduced into reaction vessel 6 wherein it contacts the liquid aqueous caustic solution 4. An effluent stream 8 which contains disulfides, hydrocarbons, and dissolve nitrogen is removed from reaction vessel 6. Effluent stream 8 is then introduced into a separator vessel 20

to produce a degassed liquid product stream 12 and an overhead vapor stream 22 containing removed nitrogen. A portion 14 of the degassed liquid product stream 12 is recycled back to reaction vessel 6. This portion of degassed liquid product stream can be combined with a sour hydrocarbon stream 16 to form a blended stream 17 which can additionally be admixed with an air stream 18 to provide the aerated liquid feed stream 2.

[Cooper et al. do not disclose a selective hydrogenation reactor, nor do they disclose a separation drum upstream of a sweetening reactor. Particularly, Cooper et al. do not disclose a stabilization drum positioned between a selective hydrogenation reactor and a sweetening reactor. Moreover, Cooper et al. fail to provide any disclosure or suggestion of a recycle line for recycling stabilized and sweetened gasoline from a sweetening reactor to a hydrogenation reactor.]


Thus, neither Frame et al. nor Cooper et al. provide any disclosure or suggestion of a stabilization drum positioned between a hydrogenation reactor and a sweetening reactor. While Cooper et al. disclose a separation vessel, this vessel is positioned downstream of a sweetening reactor, not upstream of a sweetening reactor and downstream of a hydrogenation reactor. Furthermore, while Cooper et al. disclose recycling degassed, sweetened effluent back to the sweetening reactor, neither Cooper et al. nor Frame et al. provide any disclosure or suggestion of recycling a stabilized and sweetened gasoline from a sweetening reactor to a hydrogenation reactor. Frame et al. do disclose dividing the product from a hydrogenation reactor so that one portion of the product is sent back to the hydrogenation reactor. But, Frame et al. provide no suggestion of first introducing the effluent into a stabilization drum having an outlet for removing a separated gaseous fraction, and recycling a degassed effluent from that stabilization drum to a hydrogenation reactor. As noted above, Cooper et al. provide no disclosure or suggestion with regards to hydrogenation reactors.

In view of the above remarks, it is respectfully submitted that Frame et al., taken alone or in combination with the disclosure of Cooper et al., fails to provide any suggestion that would motivate one of ordinary skill in the art to modify the process of Frame et al. in such a manner as to arrive at an embodiment in accordance with Applicants' invention.

In view of the above remarks, withdrawal of the rejection under 35 U.S.C. 103 is respectfully requested.

The Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,


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